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SELECTED SOVIET MILITARY TRANSLATIONS

NO. 26

(Materials on the Soviet Air Force)

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FOREWORD

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SELECTED SOVIET MILITARY TRANSLATIONS

NO. 26

(MATERIALS ON THE SOVIET AIR FORCE)

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Following is a translation of selected articles from various issues of the Russian-language newspaper Sovetskaya Aviatsiya (Soviet Aviation), Moscow. Specific source data is given under individual article headings./

I. THE TWO SHIFT METHOD (AIRCRAFT MAINTENANCE)

2 June 1960
Page 2

Captain A. Slobodyanik

The slanting rays of the northern sun were gilding the puddles of rainwater when Engineer Major V. Runets ordered the airmen to assemble. When all were present, he announced that the first squadron was to refuel their craft for a full radius flight. The crews in the second shift were to fly along the circle.

What sort of organization was this? What was this second shift.

The engineers and technicians were assigned the task of increasing each plane's flight. This was no simple matter. It was impossible to advance the time of departure, as a strict schedule allocates flight time. Thus each hour of flight time had to be better utilized. How could this be done?

First, specialists tightened the schedule by streamlining procedures in preparing aircraft for second flights. They specified the duties of each type of specialist, and mechanized time consuming tasks. For example, electric handcars were put into use for the transport of blocks and other equipment.

The effect of these measures was soon felt. The efficiency coefficient for the take-off period increased greatly. However, the communists went even further. They intensified their efforts to eliminate layover time for the planes. Each specialist made certain a day in advance what his duties would be, and was prepared.

But the airmen did not rest on the success achieved. More flights were being made, but not enough more.

"The problem cannot be resolved at this rate!" said the communists in the subunit commanded by Officer Kalinichenko. "More is needed here!"

What could be done except to organize work in two shifts for the subunits? To make this possible, changes had to be made in the routine for servicing equipment. The engineer of the higher command made a prompt analysis of the new plan and approved it. He also rendered practical assistance to the airmen. Technical aircraft groups, of which all specialists in charge of the preparation of aircraft for flight were members, were organized. The groups serviced the various craft in shifts.

This reorganization freed a group of trained airmen to serve

on repair teams. Aviation specialists thus had more time for classes and training, and time wasted at the airfield for many of them was eliminated.

Organizationally, each flight shift has one aviation technicians' subunit for service purposes. A commander is in charge. One shift is responsible for the servicing of a subunit, and the second helps with preflight preparations. The ground check after flight is made by the second subunit with the aid of the first. It is evident that the outstanding feature in this system of mechanical servicing is the assignment of two technical crews to each group of aircraft.

Along with organizational changes in the engineering-aviational servicing, we have intensified educational work. We are training engineers and technicians in the proper method of work. Many are now commander-teachers. But the skill which has been acquired in this responsible but complex work does not as yet meet the required standards.

The two shift method which was put into practice has now been tested. In the year of work on this new basis by the subunit flight time was doubled. The personnel was enabled to establish a first class training base, to complete the proper equipping of installations, and to effect a drastic reduction in waste.

Thus new and progressive procedures have been put into practice.

II. GUARDING THE SKIES OVER THE MOTHERLAND (PILOT TRAINING)

5 June 1960

Page 1

Air Force Major
General N. Kozlov

The Communist Party and the Soviet government are persistently pursuing a policy of peace and adamant struggle toward a decrease in international tension and the preservation of peace throughout the world. However, as indicated by recent events, there are still dark forces which would pursue an aggressive path. Foremost in this camp are the imperialists in the United States of America.

In his report to the Fifth Session of the Supreme Soviet of the USSR, Comrade N. S. Khrushchev stressed the fact that the criminal flight of the American military reconnaissance plane shot down over our territory on 1 May was not an isolated incident. Even prior to that time, the USA had been implementing aggressive and subversive actions against the Soviet Union. The statements by US leaders to the effect that similar flights for reconnaissance purposes represent official actions in regard to the USSR have provoked the righteous anger and indignation of the peoples of our country and of all progressive peoples.

The airmen in the Moscow Okrug Air Defense unit, as well as all the Soviet peoples, enthusiastically greeted and endorsed the statement made by the Chairman of the Council of Ministers of the USSR, N. S. Khrushchev, at the All-Union Conference of Leading workers on the competition for the ranks of Brigade Worker and Shock Worker of Communist Labor. In that statement he denounced these aggressions and provocations.

The Soviet people are marching with confidence toward their goal -- the construction of communism. Our noble armed forces are standing guard over the peaceful and creative labor of the Soviet people. They are ready at all times to execute the orders of the motherland honorably, and to strike a blow against aggressors who attempt to interfere with peace and tranquility in our land.

The Soviet people have entrusted to the airmen the protection of the skies over their beloved motherland. This is a high honor and a great responsibility! In order to ensure that this task can be implemented in the future, constantly increasing vigilance is required. With every passing day, the combat readiness of our units and subunits must be improved. The latest and best equipment must at all costs be thoroughly mastered, and its fullest potential must be properly understood. Our airmen must be able to fly at any altitude and speed, day or night, under all conditions. Skillful use of modern instruments and weapons with which our planes are equipped is essential.

Aviation commanders must organize all training and educational work simply and effectively. In this connection, there is still great

scope in our units: we have powerful first class equipment and men who have mastered its operation, and we have rich experience to draw upon.

By utilizing such experience, many of our commanders have achieved acquired admirable mastery of aerial warfare, precision gunnery and combat techniques. Let us take the subdivision commanded by Major Borodin as an example. All the pilots in this unit are excellent, and all the airmen are very well trained, both from the political and military points of view. This progressive crew has been awarded the Red Challenge Banner by the Moscow City Party Committee and the Moscow Soviet for its achievements. The excellence of its personnel is due to the fine educational work done by the commanders and the Party and Komsomol organizations. His awareness of his personal responsibility in connection with the tasks assigned and a high degree of ideological tempering have aided each airman to meet the demands of the Party and the Soviet government, as well as the instructions of the Minister of Defense on the steady improvement in combat readiness, successfully.

Great achievements have also been made in Military training by the airmen in the subunit commanded by Officer Dement'yev. This group includes such masters of aerial interception as Officers Koshcheyev, Ponomarev, and Karlov. All of these are first class military pilots who can handle their fighter planes with confidence at any altitude, day or night. These leading airmen, however, are well aware that one must not rest on one's laurels or become less demanding of oneself. Thus they view each flight assignment seriously and creatively, and try out new means and methods of furthering military improvement. This was particularly evident during the summer tactical maneuvers period. The personnel were called upon for unusual concentration of effort and a high level of discipline and organization.

The airmen coped with their assignments competently, proving themselves bold and brave defenders of the Soviet skies. They did not miss a single target. Great skill and determination to succeed were shown by Officers Dement'yev, Ponomarev, and others. The squadron staff received a letter from the commander of all okrug troops in which he commended them on the excellent completion of their task.

But in some subunits there are still certain weaknesses in the organization of training procedures. Regulations and flight procedures are sometimes disregarded. This reduces combat readiness to a certain extent.

For example, the extreme importance of the effective use of training time -- each hour of flight -- in combat readiness is generally understood. Yet some commanders lose sight of this factor, and in their eagerness to amass more flight time, they neglect quality in training. Naturally it is desirable that each aircraft crew gain as much flight experience as possible, but the principal criterion

must be the usefulness of the training they receive.

In most of our units, the effort to increase the number of hours in the air does not represent enthusiasm for flight for flight's sake. It is intended to further the battle readiness and skill of the crews. The subunit headed by Major Yesin serves as an example. He and his assistant make every effort to ensure the maximum utilization of time, both day and night. Special attention is devoted to the airmen's advance training, and to technical comprehension. Instruction on aviation equipment and aerodynamics and technical flight conferences are conducted regularly for the personnel. Each flight is utilized to the best possible advantage. In the past four or five months of training, all the pilots passed the standard flight tests under difficult meteorological conditions. It should also be pointed out that this crew, which has now worked as a unit for six years, has never had a flight accident or like mishap.

Proper planning, theoretical as well as practical cockpit training in instrument operation, the bold introduction of new ground training methods, carefully worked out practice maneuvers and proper flight organization are all factors which together make for fruitful utilization of each hour in the air.

The proper organization of takeoff procedure depends to a considerable extent on how carefully it has been planned. The primary essential is to ensure safe flight, and the proper sequence in the execution of training maneuvers must be observed. Unfortunately, some commanders occasionally alter the plan for the exercises. Such was the case in the subunit commanded by Major Bulychov. He changed the prescribed sequence of operations in training Pilot Rudnev. Furthermore, after a considerable lapse of time between exercises, he failed to specify the flight conditions, leaving the pilots to make their own assumptions. These infractions of flight training regulations naturally had negative results.

Battle training at our airfields is now marching forward. The airmen are performing complex flight assignments and acquiring skill in piloting their craft, aerial combat, and precision gunnery at high altitudes. They are creatively mastering the various tactical techniques. The engineering and technical crews are also working intensively. Engineers and technicians, junior specialists servicing planes, and the experts in many skills who are members of subunits make the flights possible. They are working to increase their skill and to create the conditions necessary for fruitful work on the part of the flight personnel.

In struggling to reach a high level of combat readiness, commanding officers and political organs must work constantly to instill in the airman a sense of responsibility for the quality of battle training; Party and Komsomol organizations must make every effort to see that their members fulfill their military duties in

an exemplary manner. A further improvement in the combat readiness of units and subunits must be effected and the fighting skill of Soviet pilots who guard the skies of the motherland must be perfected.

III. WELCOME! (TECHNICAL TRAINING IN OFFICERS' CLUBS)

5 June 1960
Page 2

Lieutenant Colonel A. Popov

Dusk was falling, and the lights were blinking on in the large two-story building in the middle of the small air base. "Welcome!" announced a lighted sign at the garrison Officers' Club, where military personnel and their families take part in activities in the vast halls and rooms. Some come to attend night courses in Marxism-Leninism, others to rehearse with amateur performers' groups. Still others attend the films shown.

The activities at the club are richly varied. Every evening offers a choice of interesting projects: regular classes at the night school, where fliers hear lectures on literature and the arts; a school for agitators; etc. Representatives of communist labor brigades at neighboring enterprises are frequent and welcome guests of the club. Actors from the republican theaters often put on performances for the enjoyment of the members. All these attractions draw considerable attendance at the Officers' Club, which well deserves its reputation as one of the leading cultural and educational establishments in the Military Okrug. The influence of the Political Department of this group is felt in this connection. Its workers guide the club's activities with great ability.

The Political Department is enthusiastically encouraging the recent project of establishing a school of technical studies undertaken by the club. Opinion was divided on the subject. Some said that there was already a surfeit of activities for officers. However, the wisest decision was eventually reached -- the propagation of military and technological knowledge is a vital necessity to a club with a military membership.

A plan was therefore drafted for a school of technical studies on the university level. Workers at the Officers' Club, specialists in the engineering-aviational services, and officers in the Political Department helped in the planning. It was decided that classes should be held semi-monthly. Lectures by leading workers in science and technology and on such military-technical subjects as automation and telemechanics as applied to military work, achievements in rocket technology, problems in connection with the conquering of space, the latest developments in cybernetics, and many others, and the showing of films entitled "New Developments in Science and Technology", etc. and numerous popular-scientific pictures were planned.

On the evening the school was to open, the large auditorium was filled.

Lieutenant Colonel Kuzin, head of the Officers' Club, introduced the scientists attending the opening.

Officer Nikitenko gave a speech of welcome to those present at the first session of the new School of Technical Studies. He pointed out that it would enable the officers to expand their knowledge and would help them in their other technical training. Comrade Nikitenko explained the curriculum for the year and announced the subjects on which lectures would be given.

Docent A. D. Shubin, Candidate in Technical Sciences, then took the floor. He spoke on the status of and future prospects for complex mechanization and automation in the country.

Comrade Polyakov spoke on the work done by the Automation Laboratory of the Academy of Sciences of the USSR. His talk aroused considerable interest.

The officers thanked the visiting scientists warmly for their informative talks. The first class at the School of Technical Studies increased the officers' interest in knowing more about the future development of the people's economy in the kray in which they are serving. The second will be held in the near future, and will be devoted to the subject of atomic energy.

The plan for the school calls for lectures on many subjects in connection with the operation of aviation equipment, for example "The Superiority of Soviet Scientific-Technical Thinking in the Field of Aviation Equipment", "Night Flights Using Radio-Technical Instruments", "Night Takeoffs and Landings", "Controls for Operating Engine Components", etc.

A trip has been planned for the students. They will visit scientific-technical enterprises and establishments in the city. At the university Physics and Mathematics Department laboratory, they will see modern electronic computers in operation. At the Television Center they will familiarize themselves with problems in connection with the development of television apparatus. At one of the plants, they will be introduced to rationalizers and inventors.

Scientists and university teachers, as well as outstanding commanding officers, engineers and political workers at the garrison will lecture at the school. Most of the lectures will be accompanied by popular-scientific films or slide showings. The establishment of the School of Technical Studies represents a great event in the development of this air base.

IV. SKILL IMPARTS CONFIDENCE

5 June 1960

Page 4

Engineer-Captain I. Chkalov

The aircraft specialists were only completing the replacement of the jet engine on the MIG-15 fighter trainer, but Military Pilot First Class, Major Grakhanov was, with Flight Officer Chkalov, already studying the assignment for the forthcoming test flight of the aircraft. Special attention was being devoted to the testing in air of the ART-8a over-all efficiency valve of the automatic throttle.

It would seem that there was nothing unusual in this flight, and nevertheless it was unique -- a test flight. Even if for the reason that the jet engine on the fighter had been replaced, and its units were being tested under various conditions of operation and altitude. In this case it was necessary to be prepared for all unexpected eventualities. And another important consideration -- on what the pilot says after the flight depends the subsequent normal operation of this aircraft which, as is well known, is subjected to a considerably greater load than other aircraft.

...The combat-training fighter, leaving behind it a trail of incandescent gases, smoothly broke contact with the runway and disappeared into the blue sky.

Reaching the assigned altitude, the pilot pointed the aircraft toward the airfield and began testing the operation of the ART-8a over-all efficiency valve. Soon he felt an abnormality in the operation of the engine. The fuel pressure fell, the rpm and the exhaust-gas temperature went down.

Major Grakhanov started taking the combat-training fighter down. Twice he attempted to pull the engine control a little bit toward himself /ubirat' sektor upravleniya dvigatelya nemnogo na sebya/ and to bring the rpm all the way up to the maximum rate, but the rpm did not increase. A spontaneous engine cutoff had occurred. This was also confirmed by Senior Lieutenant Volkov, who was in the second cabin. Having ordered him, over the intercom, to turn off the stopcock, Grakhanov informed the flight-control officer of what had occurred.

Judging by the calm and assured tone of the flier's voice over the loudspeaker /v dinamike/ in the control tower /na startovom kontrol'nom punkte/, the flight-control officer and all the others who were there at the time were assured of composed and competent action by Military Pilot First Class, Major Grakhanov. He has much flying experience behind him; he is a recent academy graduate.

Reaching the necessary altitude, Major Grahonov set about starting the engine.

It was clearly understood in the control tower that the situation in the air had become more involved. The combat-training ship

was a long distance from the airport, and was rapidly losing altitude. Local terrain conditions made a forced landing impossible. In case the engine failed to start, it would be necessary to give the order for ejection.

And nevertheless all had faith in a successful conclusion to this involved flight. Because in the cabin of the apparently inanimate aircraft there beat the manly hearts of two Soviet fliers -- the experienced and composed Grakhanov, and the young and competent Volkov. To save the fast-flying machine is to carry out the assigned task, and, consequently, to fulfill to the end one's duty as a soldier -- that is what they were thinking at that moment.

Setting a course for the airport, Major Grakhanov for a second time set about starting the engine. The characteristic sound was heard. The rpm indicator moved. The "heart" of the fighter started beating again.

"Have started the engine, am coming in /idu na tochku/", announced Grakhanov to the control tower in the same calm voice.

Flight-control officer Kharitonov immediately gave permission to land.

And when the MIG-15 fighter trainer taxied to the flight line and Military Pilot First Class, Major Grakhanov stepped to the ground, it seemed as if nothing essentially unusual had happened. And this is because high flying skill, excellent knowledge, and confidence in the military equipment entrusted to him are the inalienable qualities of this competent military pilot -- a patriot of his Socialist Motherland.

V. PRECISE PLANNING OF FLIGHT TRAINING

9 June 1960

Page 1

Editorial

Planning is a complicated and time-consuming process. This responsible work can only be done by officers who have the experience necessary to organize flight schedules, and are thoroughly familiar with the regulations, the standards of skill required of the personnel, and the true potential of the equipment available. The accurate planning of flight training involves the advance consideration and weighing of all factors, and the exertion of effort to ensure that schedules are transferred from paper to application in practical fashion.

Our best units and subunits have acquired considerable experience in the planning of combat training. Thus they are properly equipped to plan and execute flights intelligently under all possible meteorological conditions. Such work is being properly implemented, for example, in Air Force Unit "X" in which Officer Radchenko is serving. When practice maneuvers are planned, the crews and subunits are assigned specific tasks along with a schedule for their execution. The important factor here is that group commanders participate actively with superior commanding officers in drafting plans and schedules. These group captains know better than anyone else the individual airmen's potentialities, and can suggest the best distribution of flight tasks to ensure balanced improvement in the combat readiness of the crews as a whole.

The planning of flight training maneuvers in this unit is done in accordance with weather conditions for the area in which they will take place. Thus skill in instrument piloting can be developed, and maximum use is made of cloudy weather. Because of the level of organization of the training procedure as a whole, pilots and navigators are capably mastering techniques for flight under complex meteorological conditions, and are steadily improving combat skills.

Unfortunately, this sensible method of planning flight training is not by any means universally employed. Serious shortcomings are still being permitted in some units and subunits. In certain of these, flight personnel spend time going over exercises already mastered, including flight along a given route, group flights, practice runs and crew landings in accordance with a schedule, etc. Thus too little time is left for tactical training. In some cases, plan-schedules fail to indicate which are the tasks being performed for the first time and which have been previously practiced. The monthly flight training plans too frequently are drafted without regard to the specific opportunities which units and subunits will have to execute them.

An excessive augmentation in established flight time requirements and hours of training inevitably leads to haste during training, and disregard of the prescribed sequence of procedures. The reverse is also the case, when unjustified reductions are made in flight training. Waste of flight hours, excessive expenditures of funds and a consequent delay in the development of proper flight skills result.

Training is not being properly conducted when in a large number of instances plan-schedules are not announced to the personnel until preparations for maneuvers are completed. When this is the case, flight crews do not have time for proper study of the new material in the exercises, not to make certain of the proper procedures to be followed. This is permitted despite the fact that it is known that poor flight preparation is responsible for most flight accidents.

Those commanding officers and staffs who plan complex flight maneuvers for the end of a flying day are also in error. The fact that the alertness of trainees is at its lowest ebb at such a time, and dangerous mistakes in flight technique may occur. Certain commanding officers' lack of familiarity with the training status of their subordinates, and the resultant assignment of tasks not suited to the level of their abilities, also represents a serious shortcoming. Due to one such error, Officer Uslugin, in trying to land, leveled off at too high an altitude and cut his revolutions per minute drastically. In the very rough landing, only luck averted a serious accident. And this is not the only officer to experience such difficulties. Considerable blame can be laid to the group commander, Officer Petrunin, in this connection. It was he who made these unwise assignments, and he has frequently permitted officers to make practice solo flights when long periods have elapsed since their most recent flight time.

Precise planning of flight training is an absolute essential in the proper mastery of modern flight equipment, and a prerequisite for combat readiness on the part of air force personnel. The principle of systematic method in training calls for a creative approach to the planning of flight tasks. The establishment of flight standards and the extent of training desirable for various airmen is principally the duty of the group commander. It is his duty to assign additional flight time to pilots less adequately prepared than others.

Concentrated attention must be devoted to the improvement in professional skill of classified pilots. To this end, long range weather forecasts should be taken into account in planning maneuvers, and an adequate number of practice landings provided for. The monthly plans should set forth clearly the nature and sequence of the maneuvers to be held, as well as which pilots are expected to improve their grade classification and the time periods allocated for the purpose.

It is important that in combat training plans priority be given to tactical practice for air personnel. Battle conditions should not be simulated for isolated occasions only, but should be incorporated regularly in the training throughout the school year. For each month or training period, specific tasks should be assigned. What flight and tactical maneuvers each pilot (or crew) is expected to execute, and those in which he will take part, should be set forth.

Commanding officers, staffs, political organs, Party and Komsomol organizations are urged to concentrate on the summarization and distribution of leading experience in the planning of aerial training, bringing it to the attention of all the officers who have the serious responsibility of such planning. It should be remembered that the greater the success achieved in the resolution of the complex problems of organizing combat training is, the more effective training will be, and the higher the level attained by flight personnel in combat readiness.

VI. EXEMPLARY SUPPORT FOR FLIGHT TRAINING (REAR SERVICES)

11 June 1960

Page 1

Editorial

Reviewing the results of the day's flights, the unit commander commented that the proper completion of the schedule was due not only to the efficient and properly coordination of the work of flight and engineering-technical personnel, but also to the perfect performance by every individual in all the rear services under the command of Officer Shchigorev.

The high compliment paid to the personnel of this aviation-technical unit is well deserved. Enlisted men, noncommissioned and commissioned officers exerted their best efforts, fully aware that the combat skill of the crews, safe flights and the conditions which will guarantee them depend upon their work.

The aviation-technical services are well equipped for flight training. First class automotive, radio-technical, airfield and special apparatus and machinery are available to them. However, the materials, without personnel, are worthless. Satisfactory results can only be achieved when equipment is skillfully handled by those who are able to its best use. Thus the better qualified and aware of his responsibility a service crew member is, the greater the aid he can render in flight training. It is high quality in such aid which minimizes the possibility of accidents.

The rear service personnel has special characteristics of its own. It comprises small groups or individuals working in various parts of the airfield, usually without the direct supervision of an officer. Thus, to coordinate the rear services, it is necessary to train individuals in exemplary discipline, precision and organizational ability in order to ensure that under any circumstances and in any location their duties would be properly executed.

The experience of leading subunits indicates that wherever commanding officers and political workers, Party and Komsomol organizations are constantly educating personnel in a spirit of warm Soviet patriotism and honest fulfillment of their military duties, enlisted men and noncommissioned officers perform their work well, and render successful service. For example, the political-educational work in one of the aviation-technical units is being properly implemented. The commanding officer, the Party and Komsomol organizations have stimulated in the personnel a desire to resolve the urgent problems confronting the subunit. They have paid close attention to the needs and problems of the airmen. The Party Bureau, headed by Captain Pokid'ko (who participated in the All-Army Conference of secretaries of primary Party organizations), has initiated many valuable undertakings with the purpose of instilling in personnel a sense of duty in regard to their work. This has led to an

increase in the number of servicemen with excellent combat and political training.

Unfortunately, the service subunits whose commanding officers, Party and Komsomol organizations are so active are few and far between. If this were not the case, how could it happen that an experienced driver in one unit, Komsomol member Osipov, was careless in the performance of an important assignment. He was placed in charge of the training of a young driver, Private Sil'nichenko, in servicing night flights. Instead of explaining the procedures to be followed and closely supervising his pupil, Osipov left the trainee to fend for himself. The latter, unfamiliar with traffic regulations at the airfield, left his tractor on the taxi runway. As a result, an aircraft was damaged.

From their very first days in unit service, personnel should be trained in high moral and combat attitudes, including a sense of responsibility in regard to their assignments.

This is exactly what is done by the leading commanding officers. As an example, let us take the commander of a guard company, communist Captain Timofeyev. During the training course, each soldier is taught love for his work, precision, obedience, and a desire for perfect mastery of combat skills. On one occasion Privates Zavadko and Grigoryan broke the regulations. In checking on their actions, Captain Timofeyev concluded that these two did not have a properly developed sense of duty in regard to their military service. He spoke to his men, emphasizing the fact that perfect discipline is the foundation on which success in studies and combat is based, and is the only means toward the mastery of military skills.

But Captain Timofeyev did not stop at the lecture. He organized a meeting of the noncommissioned officers in the subunit, and the development of a sense of responsibility was also discussed at Komsomol meetings.

In order to ensure proper flight training for airmen and a high sense of duty in regard to his part in it on the part of each member of the aviation-technical units, commanding officers must combine insistence on high standards and understanding of the problems of his men. Any indulgence of violations or lack of concern about regulations and orders pertaining to aerial operations inevitably results in lack of discipline and carelessness. This situation in turn makes flight accidents more likely. For this reason it is essential that all commanding officers of aviation-technical units insist upon the implementation of regulations, deal severely with those guilty of infractions, and encourage outstanding airmen in their excellence in performance of duty.

Intensified military training is currently in progress at our air bases and target ranges. Fighter pilots, bomber crews, reconnaissance personnel, transport cadres, engineers, technicians and junior aviation specialists, inspired by the wise domestic and

foreign policies of the Communist Party and Soviet government, are sparing no effort in perfecting their combat skills and in raising the level of preparedness in the units and subunits. Side by side with flight and technical personnel, servicemen specializing in the various skills used in aviation support groups are working selflessly. Their patriotic duty is the proper execution of the tasks confronting flight personnel, the mastery and proper utilization of equipment, and the making of a worthy contribution toward the defense of the airspace above our beloved motherland.

VII. NOISELESS AIRCRAFT

12 June 1960

Page 3

A. Ivanov

At the beginning of the Second World War, the anti-aircraft defense systems of many of the world's cities involved special detection devices and large crews of monitors.

The question arises as to why a noiseless aircraft was not devised, and whether such an apparatus is a possibility.

The noise in propeller craft, including helicopters, has two basic sources. One is the internal combustion engine, and the other the air propeller. When the engine is operating, hot gases escape through the exhaust. These build up pressure in these pipes, which creates powerful sound waves.

What causes propeller noise? In cutting the air, the blades push it to the side and back. Because of the force of this movement, the air cannot return immediately to occupy its former position behind the propeller. A vacuum is created, and constitutes an interruption in the air current. In the effective area, compression is also created. This is what creates the sound.

In order for a propeller craft to operate noiselessly, then, it is evident that the energy of the internal combustion motor and the propellers which causes the sound effect must be transformed into another type of energy -- kinetic energy, for example.

A hypothesis was propounded -- the utilization of the vacuum behind the propeller blades to clean burning products from the engine cylinders, such that the exhaust gases eliminate the vacuum. Could a noiseless aircraft with increased propeller and engine efficiency not be created in this manner? This is the reasoning followed: if a man jumps off the rear of a moving train at a speed equal to that of the train, he should feel no forward or backward thrust on striking the ground, as his velocity in regard to the earth is zero. In such a case, there is an output of energy from the train in accordance with Newton's Third Law.

The same phenomenon would occur if exhaust gases were discharged from the engine to the rear of the rotating propeller blades. The force of their thrust against the air would be considerably less, as they would be deprived of a part of the energy utilized by the propellers as a jet effect (see Figure 1).

As regards the engine, its power would be increased, as the exhaust gases will emerge in a vacuum and will not encounter the resistance of atmospheric pressure.

How should the propeller be constructed? This question, apparently secondary at first glance, defied solution for numerous years.

Certain foreign inventors tried to effect the exhaust of

gases through multiple vents in the propeller blades. These were drilled into the top and back of the blades. Other experimenters believed that the gases should be discharged through an opening near the end of the tip of the blade.

But these notions did not prove to be of practical value. The reaction vector of the gases emitted from the blades was the reverse of the vector of propeller pull in the first case. The flow of air along the entire back side of the propeller blade could not be eliminated in the second case, and the gases thus retained their full force.

The best possible solution appeared to be the ejection of exhaust gas from the rim of the propeller blades, which would be specially made for the purpose (see Figure 2). Small individual openings would be drilled in the rim of the propeller blade, and controlling deflectors or nozzles would be attached. These nozzles would eject the gas, and an influx of surrounding air along the side of the sharp edge of the propeller blade. The reaction vector of the gas will thus follow the movement of the blades.

The structure envisaged in both the above theories would ensure an increase in the efficiency of the propeller by eliminating the break in the airstream along the sharp rear rim of the blade, i.e. propeller noise.

The material of which the blades should be constructed and the means of channeling gases into the rim of the blades were satisfactorily determined some time ago.

Noiseless aircraft, including helicopters, could be used extensively in the people's economy. Apart from noiseless propeller craft, it would be possible to develop, on the basis of the same principle, noiseless aerosleighs, hydroplanes, etc.

VIII. TECHNICAL ADVICE: AIDS TO COMMANDERS
(TECHNICAL ADVISORY COUNCILS)

14 June 1960
Page 1

Lieutenant General in
the Engineering-Technical
Services V. Koblikov

The appeal to the people by the Soviet Union which was decided upon by the June Plenum of the Central Committee of the CPSU states: "Let every worker, engineer, scientist, Kolkhoz member, agronomer, teacher and doctor study the decisions of the plenum and devise ways to implement them in his practical work. Let every working staff work out a plan for mastering and implementing in service the achievements in science, technology and automation, and for better utilizing the production potential and facilities existing in order to accelerate the fulfillment of the Seven-Year Plan."

On the recommendation of the CC of the CPSU, technical commissions were established and have served successfully in industrial enterprises. Their duties include resolving numerous and varied technical problems in connection with further improvement in quality and quantity of production, the rational utilization of equipment, an increase in labor productivity, and the advance of automation and mechanization in production processes. These councils have at some enterprises taken on staff activities in connection with technical problems, and have become operative units working toward a high level in production.

This undertaking has received warm support from aviation units, as well as air force maintenance enterprises. The engineering-aviation service personnel under the command of Comrade F. A. Zaikin has undertaken to put into military practice the experience acquired by the technical commissions at industrial enterprises. In accordance with instructions from the Commander-in-Chief of the Air Force, technical councils are to be established for all aviation units, air force schools, and aircraft maintenance enterprises.

Technical councils are consultative organs. Their recommendations are put into practice on the orders of commanding officers. Such councils should be composed of the best-trained, enterprising and authoritative officers among the engineers and technicians, pilots, and navigators, as well as the best rationalizers and innovators in subunits and units.

The priority task of technical councils is thorough analysis of the operation of aviation equipment each month, and the drafting of specific proposals in connection with errors and irregularities noted. Councils must see to improvement in the operation and repair of aviation equipment, an increase in labor productivity and in mechanization and automation of the processes of servicing and

operating equipment, the introduction of progressive technology, and a reduction in work costs. They also deal with such matters as the study, summarization and application of leading experience, the best utilization of equipment and machinery, the development of multipurpose and portable attachments, and the creation of new training equipment models, as well as the improvement of existing ones.

By successfully completing this task, the technical commissions can greatly assist commanding officers in effectively utilizing aviation equipment, ensuring safe flight, and improving the combat training of units and subunits. This is made evident by the limited but revealing experience acquired from the work of the technical commissions headed by Officers Buldakov, Nichipurenko, Koshelev and Filipenko.

The technical council of the unit in which Engineering Major Buldakov is serving was established in September of 1959. It was composed of eleven persons, specializing in various fields. However, as many as 30 activists usually attend the monthly conferences. The council has two sections: flight and technical. The latter is divided into subsections for the various basic types of work. Plans are drafted for the council's monthly work, as well as its annual tasks. The council usually has at least two meetings in connection with each technical problem: at the first session, the difficulty is presented, and possible means of dealing with it are discussed. At the second meeting, specific proposals are detailed and analyzed.

Such collective creative work has proved a very effective means, far better than individual effort. Thus, for example, in connection with combat training, the use of autopilots at altitudes less than those recommended arose. The technical council energetically undertook the search for the best means of resolving the problem.

In accordance with research done by the technical council, the commanding officer ordered a practice bombardment from a low altitude using the autopilot. After a period of experimentation, the results were passed on to the higher staff who made it available to other units.

Considerable success has also been achieved by the councils under the command of Engineering Lieutenant Colonel Koshelev and Engineering Major Filipenko. As a result of their fruitful activities, layovers of aircraft for repair purposes were cut drastically, and the number of aviation equipment failures, as compared with the same period last year, was cut in two. The council members devoted much energy and effort to the expansion of training facilities. This was favorably reflected in the advancement in grade of flight and technical personnel.

The activities of the technical councils must be carried

out systematically. Excellent results can be obtained only when such councils do practical work, are thoroughly familiar with the needs of the units, and deal promptly with the urgent technical problems which arise in the course of implementing the combat training plans.

However, the technical councils must not be restricted to the narrow scope of immediate problems. It is also their responsibility to take up matters connected with the servicing and utilization of new aviation equipment, and to ensure accident-free flights and the conditions necessary therefor. The effectiveness of a council's work depends to a considerable extent upon the active participation of a broad group of air personnel. The larger the number of persons who submit proposals of value in connection with the resolution of specific technical problems, the better the results of the council's work will be. For this reason, it is extremely important that creative thinking on the part of the airmen be developed, and the expansion of the number of rationalizers and inventors must be continued. To this end, a periodic review of the activities of the councils is useful, and general meetings of the unit military personnel should be devoted to such analyses.

An essential to success in the work of the technical councils is constant guidance by the commanding officers of the units. These latter must promote the patriotic upsurge on the part of the military such that prior to the forthcoming July Plenum of the CC of the CPSU they will improve operational methods for aviation equipment and will make the maximum utilization of inner resources and potentialities.

Commanding officers, political organs and heads of engineering and aviation services in groups cannot remain indifferent to these tasks. It is their duty to respond promptly to the needs and requirements of the councils, and to implement and spread the knowledge of valuable working experience as widely as possible. It can confidently be stated that given active and skillful management, the technical councils everywhere can become valuable aids to commanding officers in the mastery, operation, and profitable utilization of complex military equipment.

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